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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/621,775	07/17/2003	Edison Fong	VEON-500 [FOV-123]	1682

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EXAMINER
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DEB, ANJAN K

ART UNIT	PAPER NUMBER
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2858

DATE MAILED: 10/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/621,775

Applicant(s)

FONG ET AL.

Examiner

Anjan K Deb

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07/17/03 and interview summary 9/7/04.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 54-61 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 54-61 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 07/17/2003.
- 4) ☒ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. 10/6/2004.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-7, 54-61, drawn to sensing apparatus comprising output generation circuit, classified in class 324, subclass 522.
  - II. Claims 8-22 and 42-53, drawn to sensing apparatus comprising capacitor and charging circuitry, classified in class 324, subclass 548.
  - III. Claims 23-41, 62-65, drawn to sensing apparatus comprising current mirror, classified in class 365, subclass 185.21.

Inventions I, II and III are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions have different modes of operation as indicated above.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

During a telephone conversation with attorney Equitz Alfred, election was made to prosecute the invention of Group I, claims 1-7 and 54-61.

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Non-elected claims 8-53, 62-65 are cancelled by the applicant (interview summary attached).

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-5, 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morrow (US 4,142,150).

Re claims 1, 54 Morrow discloses (Fig. 1-2) sensing apparatus and method, including at least one sensor cell 36 configured to produce a sensor current indicative of a sensed value (emitter current level of transistor 10) and a readout circuit (22,26,32, EMITTING CURRENT READING) having an input node coupled to receive the sensor current, wherein the readout circuit also includes an output node and output voltage generation circuitry between the input node and the output node, wherein the output voltage generation circuitry (22,32) is configured to generate an output voltage 32 indicative of the sensed value in response to the sensor current (EMITTING CURRENT READING).

Morrow did not expressly disclose clamping the input node at a potential that is at least substantially fixed, but would have been obvious to do so since Morrow disclosed capacitor 30 connected between (-) input and output of amplifier 22 to prevent oscillations of the amplifier.

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Morrow by adding clamping the input node at a potential that is at least substantially fixed to prevent oscillations of the amplifier.

Re claim 2, Morrow discloses sensing apparatus includes output voltage generation circuitry having at least one circuit element, and a differential pair (differential amplifier 22) coupled and configured to provide feedback (24,30) to the at least one circuit element to reduce voltage excursion (prevent oscillations of the amplifier) at the input node during generation of the output voltage.

Re claim 3, Morrow discloses sensing apparatus includes at least one circuit element is a load transistor (38,40) coupled to the differential pair (differential amplifier 22).

Re claim 4, Morrow discloses voltage generation circuitry includes op-amp (amplifier) 22 having an input coupled to the input node and an output, and at least one circuit element (24,30) coupled between the output of the op-amp and the input node and configured to provide feedback from output of the op-amp to the input node.

Re claim 5, Morrow discloses input of op-amp 22 is an inverting input (-), the op-amp also has a non-inverting input (+), and the at least one circuit element is a resistor 24 coupled between the inverting input (-) and the output of the op-amp 22.

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4. Claim 6, is rejected under 35 U.S.C. 103(a) as being unpatentable over Morrow (US 4,142,150) in view of Champlin (US 4,816,768).

Re claims 6,57 Morrow disclosed all of the claimed limitations as set forth above except a transistor having a channel terminal coupled to inverting input of op-amp and gate coupled to the output of the op-amp.

Champlin discloses op-amp (amplifier A1) has inverting and non-inverting input, and at least one circuit element is a transistor Q1 having a channel terminal coupled to the inverting input (through resistor R4, R5) and a gate coupled to the output of the op amp (amplifier A1)(column 5 lines 55-67)(Fig. 2).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Morrow by adding transistor gate connected to amplifier output and by connecting a transistor channel to the input of amplifier disclosed by Champlin so that the inverting (-) and non-inverting (+) input of amplifier assume the same dc bias voltage (Champlin: column 5 lines 55-67).

5. Claims 7, 55-56, 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morrow (US 4,142,150) in view of Yoneyama (US 6,480,227 B1).

Re claims 7, 55-56, 58 Morrow disclosed all of the claimed limitations as set forth above except input node coupled by a column line to sensor cell, and output voltage generation circuitry includes a readout capacitor coupled to the output node, and the output voltage generation circuitry is configured to charge a readout capacitor to a voltage indicative of the sensed value while clamping the input node at a potential that is at least substantially fixed.

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Yoneyama discloses sensor for measuring current comprising amplifier output connected to readout capacitor  $C_{\text{sub}}$  (Fig. 3).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Morrow by adding capacitor disclosed by Yoneyama for charging the capacitor to a voltage indicative of the sensed value.

6. Claim 57, is rejected under 35 U.S.C. 103(a) as being unpatentable over Morrow (US 4,142,150) in view of Yoneyama (US 6,480,227 B1) and further in view of Champlin (US 4,816,768).

Re claim 57, Morrow and Yoneyama disclosed all of the claimed limitations as set forth above except providing feedback from output node via load transistor.

Champlin discloses providing feedback from output node via load transistor Q1 (column 5 lines 55-67)(Fig. 2).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Morrow and Yoneyama by adding transistor disclosed by Champlin for providing feedback to amplifier so that the inverting (-) and non-inverting (+) input of amplifier assume the same dc bias voltage (Champlin: column 5 lines 55-67).

7. Claims 59-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morrow (US 4,142,150) in view of Yoneyama (US 6,480,227 B1), and further in view of Johnson (US 5,059,916).

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Re claims 59-61, Morrow modified by Yoneyama disclosed all of the claimed limitations as set forth above except generating mirror current not identical to sense current and greater than sense current.

Johnson discloses generating mirror current (10x) not identical to sense current (x) and greater than sense current (10x)(column 3 lines 53-60)(Fig. 5).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify Morrow and Yoneyama by adding mirror current disclosed by Johnson for generating current greater than sense current for amplification of sensed current.



***Conclusion***

8 . The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Faulkner (US 4,788,494) discloses power measuring circuit comprising current mirror and feedback amplifier (Fig. 3).

Gosser (US 4,181,885) discloses current sensing apparatus and method comprising amplifier 741 having output connected to load transistor with feedback.

Kalb (US 5,801,533) discloses apparatus for sensing differential current comprising transistors 309 and 311 coupled in a current mirror configuration.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Anjan K. Deb whose telephone number is 571-272-2228. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le, can be reached at (571) 272-2233.



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